What Is Claimed Is:

1. A device, comprising:

a positive action thermal switch having at least two mutually electrically isolated terminals; and

an electrical temperature sensor integral with the positive action thermal switch and sharing one or more common terminals.

2. The device of claim 1 wherein the positive action thermal switch is a snap-action thermal switch.

3. The device of claim 1 wherein the snap-action thermal switch is structured having a pair of terminals being mutually electrically isolated when the snap-action thermal switch structured in a normally open configuration; and

the integral electrical temperature sensor is electrically coupled to provide an output on the pair of electrically isolated terminals.

4. The device of claim 3 wherein the pair of mutually electrically isolated terminals are shorted together when the device senses an ambient temperature higher than a predetermined set point of the snap-action thermal switch.

5. The device of claim 3 wherein the integral electrical temperature sensor is mounted on an interior surface of the snap-action thermal switch.

6. The device of claim 5, further comprising a bonding agent between the electrical temperature sensor and the interior surface of the snap-action thermal switch.

7. The device of claim 6 wherein the bonding agent is a thermally conductive epoxy.

8. The device of claim 2 wherein the snap-action thermal switch is structured having three terminals being mutually electrically isolated, two of the three terminals being shorted together when electrical contacts mounted on the two terminals are closed; and

the integral electrical temperature sensor is electrically coupled to provide an output on a third one of the electrically isolated terminals.

9. The device of claim 8 wherein a first one of the two terminals is structured for being coupled to a voltage source and a second one of the two terminal is structured for being coupled to a load; and

the integral electrical temperature sensor includes one terminal electrically coupled the first one of the two terminals that is structured for being coupled to a voltage source and a second terminal coupled to the third one of the electrically isolated terminals.

10. The device of claim 9 wherein the integral electrical temperature sensor is selected from a group of electrical temperature sensors that includes a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, a monolithic silicon temperature transducer, and another equivalent conventional electrical temperature sensor.

11. The device of claim 10 wherein the integral electrical temperature sensor is a monolithic silicon transducer having a substantially linear temperature output.

12. The device of claim 2 wherein the snap-action thermal switch is structured having at least four terminals being mutually electrically isolated, a first two of the at least four terminals being shorted together when electrical contacts mounted on the two terminals are closed; and

the integral electrical temperature sensor is electrically being coupled between a second different two of the electrically isolated terminals.

13. A multiple output thermal detection and protection device, comprising:

a two-terminal snap-action thermal switch structured in a normally open configuration; and

an electrical temperature sensor thermally and electrically coupled to the snap-action thermal switch.

14. The device of claim 13 wherein the electrical temperature sensor is mounted on an interior surface of the snap-action thermal switch using a thermally conductive bonding agent.

15. The device of claim 13 wherein the electrical temperature sensor is mounted on an exterior surface of the snap-action thermal switch using a bonding agent.

16. The device of claim 13 wherein the electrical temperature sensor and the snap-action thermal switch output a signal representative of temperature using one or more electrical terminals in common.

17. The device of claim 16 wherein the snap-action thermal switch is structured to be normally open at sensed temperatures below a predetermined set point;

the two-terminal snap-action thermal switch includes two terminals that are mutually electrically isolated when the snap-action thermal switch structured in the normally open configuration; and

the integral electrical temperature sensor is electrically coupled across the two isolated terminals.

18. The device of claim 17 wherein electrical contact portions of the two isolated terminals are closed at sensed temperatures above a predetermined set point.

19. The device of claim 16 wherein the two-terminal snap-action thermal switch includes two electrical terminals that are mutually electrically isolated when the snap-action thermal switch structured in the normally open configuration;

the snap-action thermal switch is structured to be in one of the normally open and a normally closed configuration at sensed temperatures below a predetermined set point;

further comprising a third electrical terminal that is mutually electrically isolated from the two electrical terminals of the two-terminal snap-action thermal switch; and

wherein one of the two isolated terminals of the two-terminal snap-action thermal switch is shared by one terminal of the integral electrical temperature sensor, and a second terminal of the integral electrical temperature sensor is electrically coupled to the third electrical terminal.

20. The device of claim 19 wherein the shared one of the two isolated terminals of the two-terminal snap-action thermal switch is structured to be coupled to a voltage source, a

second one of the two isolated terminals is structured to be coupled to a load, and the output of the integral electrical temperature sensor is coupled to the third electrical terminal.

21. The device of claim 20 wherein the integral electrical temperature sensor is an electrical temperature sensor selected from a group of electrical temperature sensors that includes a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, and a monolithic silicon temperature transducer.

22. The device of claim 20 wherein the integral electrical temperature sensor is a model AD590 flat package, two-terminal temperature transducer microchip available commercially from Analog Devices, Norwood, MA (vendor CAGE number 24355).

23. The device of claim 13 wherein the two-terminal snap-action thermal switch includes first and second electrical terminals that are mutually electrically isolated when the snap-action thermal switch structured in the normally open configuration; and

further comprising a third and fourth electrical terminals that are mutually electrically isolated from the first and second electrical terminals of the two-terminal snap-action thermal switch; and

wherein first and second terminals of the integral electrical temperature sensor are electrically coupled respectively to the third and fourth electrical terminals.

24. The device of claim 23 further comprising a fifth electrical terminal that is mutually electrically isolated from the first, second, third and fourth electrical terminals; and

wherein one of the first and second terminals of the integral electrical temperature sensor is electrically coupled to the fifth electrical terminal to provide resistance compensation capability.

25. A multiple output thermal detection and protection device, comprising:

first and second terminals extending through a substantially planar header and being electrically isolated therefrom;

a first stationary contact adjacent to one end of the first terminal;

a second contact adjacent to one end of the second terminal and being movable between a first position spaced away from the first stationary contact in an open circuit

structure and a second position in contact with the first stationary contact in a closed circuit structure;

an upright tubular spacer projecting from the header and surrounding the first and second contacts and the portions of the first and second terminals adjacent to the contacts;

a housing enclosing the spacer, the first and second contacts, and the portions of the first and second terminals adjacent to the contacts, the housing extending beyond the spacer and cooperating with the spacer to form an annular space therebetween spaced away from the contacts;

a disc actuator captured within the annular space and being responsive to a sensed temperature to change state between a concave and a convex relationship to the electrical contacts, such that the disc actuator spaces the movable contact away from the stationary contact when in the concave relationship and the disc actuator permits the movable contact to contact the stationary contact when in the convex relationship; and

an electrical temperature sensor sharing one or more of the first and second terminals in common with the respective first and second contacts and being structured to provide an output representative of the sensed temperature.

26. The device of claim 25 wherein the disc actuator is a bi-metallic disc being structured to change state at a predetermined sensed temperature.

27. The device of claim 26 wherein the disc actuator is structured to be in the concave relationship to the electrical contacts when the sensed temperature is below the predetermined sensed temperature.

28. The device of claim 27 wherein the electrical temperature sensor shares both of the first and second terminals in common with the respective first and second contacts and being structured to provide an output representative of the sensed temperature on one of the first and second terminals when the sensed temperature is below the predetermined sensed temperature.

29. The device of claim 28 wherein the electrical temperature sensor is one of a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, and a monolithic silicon temperature transducer.

30. The device of claim 26 wherein the disc actuator is structured to be in one of the concave and convex relationships to the electrical contacts when the sensed temperature is below the predetermined sensed temperature;

a third terminal extends through the header and being electrically isolated therefrom; and

the electrical temperature sensor shares one of the first and second terminals in common with the respective first and second contact and is electrically coupled to the third terminal to provide an output representative of the sensed temperature thereon.

31. The device of claim 30 wherein the electrical temperature sensor is one of a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, and a monolithic silicon temperature transducer.

32. The device of claim 26 wherein the disc actuator is structured to be in one of the concave and convex relationships to the electrical contacts when the sensed temperature is below the predetermined sensed temperature;

a third terminal and a fourth terminal extend through the header and each being electrically isolated therefrom; and

the electrical temperature sensor is coupled to the third and fourth terminals in an independent circuit from the electrical contacts actuated by the disc actuator to provide an independent output representative of the sensed temperature thereon.

33. The device of claim 32 wherein the electrical temperature sensor is one of a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, and a monolithic silicon temperature transducer.

34. The device of claim 33 wherein the electrical temperature sensor is coupled to each of the third and fourth terminals and to one of the first and second terminals.

35. The device of claim 32, further comprising a fifth terminal extending through the header and being electrically isolated therefrom; and

wherein the electrical temperature sensor is a monolithic silicon temperature transducer being electrically coupled to at least two of the third, fourth and fifth terminals.

36. A three-terminal multiple output thermal detection and protection device, comprising:

first, second and third terminals extending through and on either side of a substantially planar header and being electrically isolated therefrom and from one another;

a first stationary contact fixed adjacent to one end of the first terminal;

a second contact fixed adjacent to one end of the second terminal and being movable between a first position spaced away from the first stationary contact in an open circuit structure and a second position in contact with the first stationary contact in a closed circuit structure;

an upright tubular spacer affixed to and projecting from the one side of the header and surrounding the first and second contacts, the portions of the first and second terminals adjacent to the contacts, and the third terminal;

a housing enclosing the spacer, the first and second contacts, the portions of the first and second terminals adjacent to the contacts, and the third terminal, the housing extending beyond the spacer and cooperating with the spacer to form a space therebetween spaced away from the contacts;

a disc actuator captured within the space between the spacer and the housing and being responsive to a sensed temperature for changing state between a first pressing upon and a second spaced away relationship to the movable electrical contact, such that the disc actuator spaces the movable contact away from the stationary contact when in the first pressing upon relationship and the disc actuator permits the movable to move into contact with the stationary contact when in the second spaced away relationship; and

an electrical temperature sensor sharing one of the first and second terminals in common with the respective first and second contacts and being coupled to the third terminal for providing an output signal representative of the sensed temperature.

37. The device of claim 36 wherein the disc actuator is structured to be in one of the first pressing upon relationship and the second spaced away relationship to the electrical contacts when the sensed temperature is below the predetermined sensed temperature.

38. The device of claim 36 wherein the electrical temperature sensor is one of a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, and a monolithic silicon temperature transducer.

39. A four-terminal multiple output thermal detection and protection device, comprising:

first, second, third and fourth terminals extending through and on either side of a substantially planar header and being electrically isolated therefrom and from one another;

a first stationary contact fixed adjacent to one end of the first terminal;

a second contact fixed adjacent to one end of the second terminal and being movable between a first position spaced away from the first stationary contact in an open circuit structure and a second position in contact with the first stationary contact in a closed circuit structure;

an upright tubular spacer affixed to and projecting from the one side of the header and surrounding the first and second contacts, the portions of the first and second terminals adjacent to the contacts, and the third terminal;

a housing enclosing the spacer, the first and second contacts, the portions of the first and second terminals adjacent to the contacts, and the third terminal, the housing extending beyond the spacer and cooperating with the spacer to form a space therebetween spaced away from the contacts;

a disc actuator captured within the space between the spacer and the housing and being responsive to a sensed temperature for changing state between a first pressing upon and a second spaced away relationship to the movable electrical contact, such that the disc actuator spaces the movable contact away from the stationary contact when in the first pressing upon relationship and the disc actuator permits the movable to move into contact with the stationary contact when in the second spaced away relationship; and

an electrical temperature sensor electrically coupled between the third and fourth terminals for providing an output signal representative of the sensed temperature.

40. The device of claim 39 wherein the electrical temperature sensor is one of a resistance thermal device (RTD), a platinum resistance thermal device (PRTD), a thermistor, a thermocouple, and a monolithic silicon temperature transducer.

41. The device of claim 39 further comprising a fifth terminal extending through and on either side of a substantially planar header and being electrically isolated therefrom and from each of the first, second, third, and fourth terminals; and

wherein the electrical temperature sensor is a monolithic silicon temperature transducer being electrically coupled to at least two of the third, fourth and fifth terminals.

42. A method for providing thermal detection and protection in a single device, the method comprising:

sensing temperature with an electrical temperature sensor portion of a first circuit;

outputting on the first circuit a signal representative of the sensed temperature;

sensing a predetermined set point temperature; and

positively closing a second circuit in response to sensing the predetermined set point temperature.

43. The method of claim 42 wherein the first and second circuits share at least one common terminal.

44. The method of claim 43 wherein closing the second circuit shorts the first circuit.

45. The method of claim 43 wherein sensing temperature with an electrical temperature sensor portion of a first circuit is operated after positively closing the second circuit.